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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,381	09/28/2001	Rainer Klisch	030650-073	2264

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EXAMINER

SKED, MATTHEW J

ART UNIT	PAPER NUMBER
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2655

DATE MAILED: 12/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/964,381	Applicant(s) KLISCH ET AL.	
	Examiner Matthew J Sked	Art Unit 2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/27/01</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. Claims 9-12 recite the limitation "the one or more prosodic parameter thresholds", however independent claim 7 does not mention a prosodic parameter threshold. There is insufficient antecedent basis for this limitation in the claim. For the purpose of examination it will be assumed that claims 9-12 are dependent upon claim 8.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (U.S. Pat. 6,076,056) in view of Gandhi et al. (U.S. Pat. 6,285,980).

As per claims 1 and 19, Huang teaches a method and device for analyzing a spoken sequence of words recognized by automatic speech recognition, comprising:

determining a speaking pause length between two consecutive words (silence detection module detects silence between words and phrases, col. 11, lines 56-60);
and

deciding whether or not the two consecutive words belong to a single phrase on the basis of the determined speaking pause length (phrase detected by detecting pauses, col. 12, line 67 and line 13, line 1).

Huang does not teach or specifically suggest that these words be numbers.

Gandhi teaches a system for natural number recognition through context-dependent language models (col. 3, lines 40-42).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the phrase recognition system of Huang to recognize numerical values as taught by Gandhi because, as suggested by Gandhi, the system to recognize the telephone digits, time of day, date, and monetary amounts, hence making the system more versatile (col. 2, lines 1-8).

5. As per claim 2, Huang teaches defining a pause length threshold and deciding whether or not the two consecutive numbers belong to a single numerical value by comparing the determined speaking pause length with the pause length threshold (decides if words are in a phrase if the duration of the phrase is above a threshold, col. 12, line 67 through col. 13, line 5).

6. As per claim 3, Huang teaches the pause length threshold is initially set to an empirical value (threshold is empirically determined, col. 13, lines 5-8).

7. As per claim 4, Huang and Gandhi do not teach that the pause length threshold is user-adjustable.

However, the Examiner takes Official Notice that adjusting a threshold manually is well known in the art. Therefore it would have been obvious to one of ordinary skill in

the art at the time of invention to modify the system of Huang and Gandhi to have the pause length threshold user-adjustable because it would allow the user to change the threshold to the user's liking, hence making the system more user-friendly.

8. As per claim 5, Huang teaches the pause length threshold is automatically adjusted dependent on the appropriate training data (determined based on training data, col. 13, lines 5-8).

9. As per claim 6, Huang and Gandhi do not teach the pause length threshold is shifted on the basis of one or more previously determined speaking pause lengths.

However, the Examiner takes Official Notice that automatically adapting thresholds is well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have the pause length threshold shifted on the basis of one or more previously determined speaking pause lengths because it would give better recognition results further in implementation of the method.

10. As per claims 7 and 20, Huang teaches determining one or more further prosodic parameters apart from the speaking pause length and deciding whether or not the two consecutive numbers belong to a single numerical value based also on the one or more determined further prosodic parameters (uses pause duration to determine the phrase duration and uses the phrase duration to determine if a corresponding phrase exists, col. 13, lines 12-16 and 28-31).

11. As per claim 8, Huang teaches defining one or more prosodic parameter thresholds and deciding whether or not the two consecutive numbers belong to a single numerical value also by comparing the one or more determined prosodic parameters

with the one or more prosodic parameter thresholds (compares the phrase duration to threshold, col. 13, lines 17-20).

12. As per claim 9, Huang teaches the one or more prosodic parameter thresholds are initially set to empirical values (threshold empirically determined, col. 13, lines 19-22).

13. As per claim 10, Huang and Gandhi do not teach the one or more prosodic parameter thresholds are user-adjustable.

However, the Examiner takes Official Notice that adjusting a threshold manually is well known in the art. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Huang and Gandhi to have the one or more prosodic parameter thresholds user-adjustable because it would allow the user to change the threshold to the user's liking hence making the system more user-friendly.

14. As per claim 11, Huang teaches the one or more prosodic parameter thresholds are automatically adjusted dependent on appropriate training data (determined based on training data, col. 13, lines 19-22).

15. As per claim 12, Huang and Gandhi do not teach the one or more prosodic parameter thresholds are shifted on the basis of one or more previously determined speaking pause lengths.

However, the Examiner takes Official Notice that automatically adapting thresholds is well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have the one or more prosodic

parameter thresholds shifted on the basis of one or more previously determined speaking pause lengths because it would give better recognition results further in implementation of the method.

16. As per claim 13, Huang teaches the speaking pause length is determined by measuring a silence interval between two consecutive numbers (silence detector detects silence between words and phrases, col. 11, lines 54-58).

17. As per claim 14, Huang teaches obtaining an end point of a first of the two consecutive numbers and a starting point of a second of the two consecutive numbers during automatic speech recognition and determining the speaking pause length based on the end point and the starting point (silence detection module determines the boundaries between phrases and uses those boundaries to determine the duration, col. 11, lines 54-57 and col. 13, lines 1-5).

18. As per claims 15 and 21, Huang does not teach recognizing a connecting word within the spoken sequence of numbers.

Gandhi teaches recognizing a connecting word within the spoken sequence of numbers (natural number vocabulary includes connecting words "and, a, point", Table 1).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Huang to recognize a connecting word within the spoken sequence of numbers as taught by Gandhi because the presence of connecting words has an impact on the spoken number hence giving better number recognition.

19. As per claim 16, Huang and Gandhi do not teach upon recognition of a connecting word, the decision whether or not two consecutive numbers belong to a single numerical value is based on a pause length threshold which is specific for the recognition of a connecting word.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Huang and Gandhi to have upon recognition of a connecting word, the decision whether or not two consecutive numbers belong to a single numerical value is based on a pause length threshold which is specific for the recognition of a connecting word because both the pause lengths would indicate the speaker's speaking rate and so would apply for number sequences that contain a connection word.

20. As per claim 17, Huang teaches a method for analyzing a spoken sequence of numbers, comprising:

recognizing the spoken sequence of words by automatic speech recognition (identifies word sequences, col. 12, lines 56-60);

determining a speaking pause length between two consecutively recognized words (silence detection module detects silence between words and phrases, col. 11, lines 56-60); and

deciding that the two consecutively recognized words belong to different phrases if the determined speaking pause length exceeds a pause length threshold (decides if words are in a phrase if the duration of the phrase is above a threshold, col. 12, line 67 and col. 13, lines 1-5).

Huang does not teach or specifically suggest that these words be numbers.

Gandhi teaches a system for natural number recognition through context-dependent language models (col. 3, lines 40-42).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the phrase recognition system of Huang to recognize numerical values as taught by Gandhi because, as suggested by Gandhi, the system to recognize the telephone digits, time of day, date, and monetary amounts, hence making the system more versatile (col. 2, lines 1-8).

21. As per claim 18, Huang teaches a method for analyzing a spoken sequence of numbers, comprising:

recognizing the spoken sequence of words by automatic speech recognition(identifies word sequences, col. 12, lines 56-60);

determining a speaking pause length between two consecutively recognized words (silence detection module detects silence between words and phrases, col. 11, lines 56-60) and determining at least one further prosodic parameter apart from the speaking pause length parameters (uses pause duration to determine the phrase duration, col. 13, lines 12-16); and

deciding whether or not the two consecutively recognized numbers belong to a single numerical value based on both the determined speaking pause length and the at least one determined further prosodic parameter (uses the phrase duration found from the pause duration to determine if a corresponding phrase exists, col. 13, lines 28-31).

Huang does not teach or specifically suggest that these words be numbers.

Gandhi teaches a system for natural number recognition through context-dependent language models (col. 3, lines 40-42).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the phrase recognition system of Huang to recognize numerical values as taught by Gandhi because, as suggested by Gandhi, the system to recognize the telephone digits, time of day, date, and monetary amounts, hence making the system more versatile (col. 2, lines 1-8).

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Caminero et al. ("Improving Utterance Verification Using Hierarchical Confidence Measures in Continuous Natural Numbers Recognition"), Kvale et al. ("Improved Automatic Recognition of Norwegian Natural Numbers by Incorporating Phonetic Knowledge"), Gerson et al. (U.S. Pat. 4,870,686), and Henry, Jr. (U.S. Pat. 6,526,292) teach methods for number recognition. Power et al. (U.S. Pat. 5,848,388), Aktas (U.S. Pat. 5,970,452), and Kushner et al. (U.S. Pat. 6,321,197) teach pause detection methods in speech recognition.

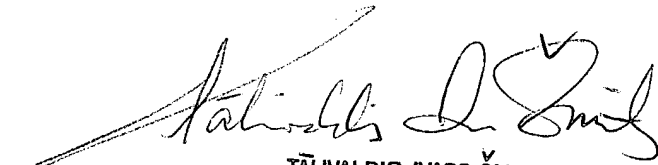
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J Sked whose telephone number is (703) 305-8663. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

Art Unit: 2655

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis Smits can be reached on (703) 306-3011. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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12/02/04



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